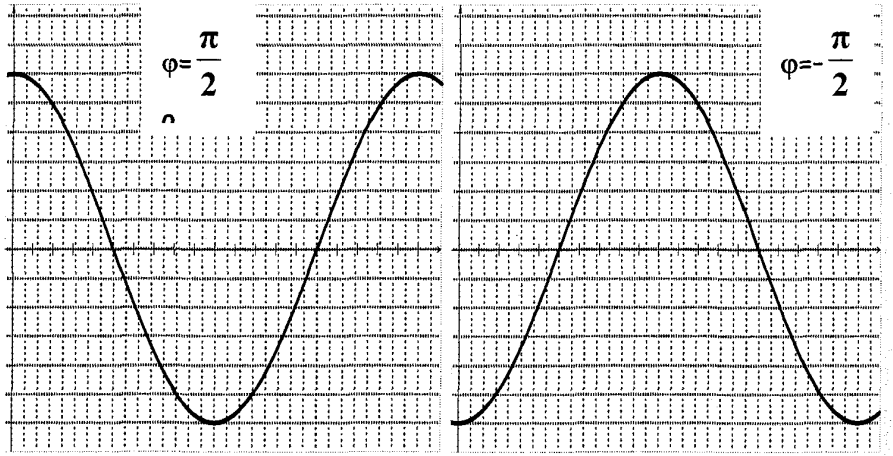


3°)

a- $E_e = \frac{1}{2}\frac{q^2}{C}$ or $q = Q_{max}\sin(\omega_0 t + \frac{\pi}{2})$

$E_e = \frac{1}{2}\frac{Q_{max}^2}{C}\sin^2\left(\omega_0 t + \frac{\pi}{2}\right)$

$E_e = E_0 \sin^2\left(10^3 t + \frac{\pi}{2}\right)$

$E_L = \frac{1}{2}Li^2$ or $i = Q_{max}\omega_0\cos(\omega_0 t + \frac{\pi}{2})$

$E_m = \frac{1}{2}LQ_{max}\omega_0\cos^2\left(\omega_0 t + \frac{\pi}{2}\right)$

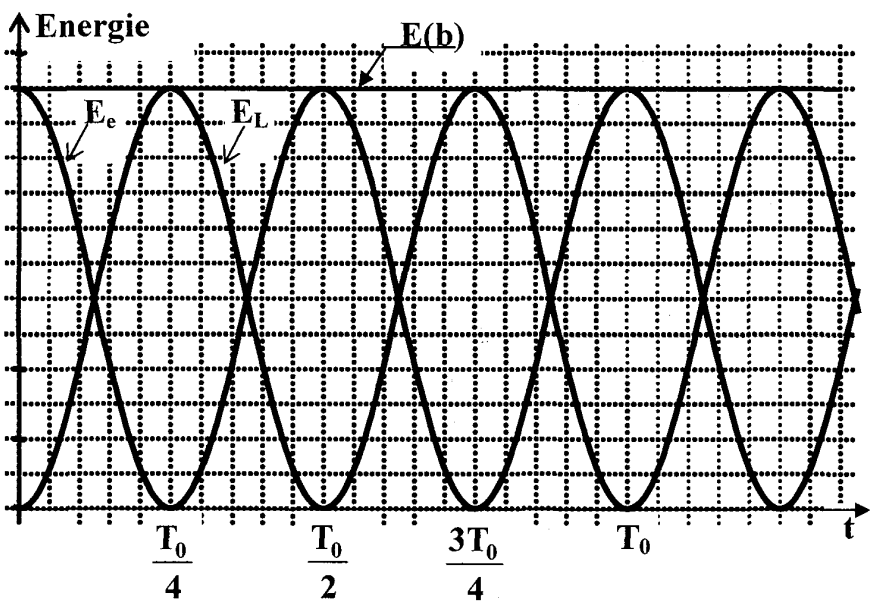
$= \frac{1}{2}L\frac{Q_{max^2}}{C}\cos^2\left(\omega_0 t + \frac{\pi}{2}\right) = E_0\cos^2\left(\omega_0 t + \frac{\pi}{2}\right)$

b- $E = E_e + E_m$

$= E_0\left(\sin^2\left(\omega_0 + \frac{\pi}{2}\right) + \cos^2\left(\omega_0 t + \frac{\pi}{2}\right)\right)$

$\Rightarrow E = E_0 = 5.10^{-5}\,J$

Elle ne dépend pas du temps.

$\Rightarrow$ L'energie se conserve.

c-